

REMARKS

The Applicants request reconsideration of the Final Rejection dated October 3, 2003.

Claims 2-4, 16-17, 19-20, and 24-25 are now pending.

The rejection of claim 24 under 35 U.S.C. § 112, second paragraph, has been rendered moot by canceling the claim.

Claims 2-11, 16-19, and 21-25 were finally rejected over various combinations of the following documents:

JP 05-325261 (Hirota)

JP 05-159360 (Okada)

EP 0359114 (Sekiya)

U.S. Patent No. 6,159,573 (Zhou)

U.S. Patent No. 6,300,039 (Ohbayashi)

U.S. Patent No. 6,177,166 (Ohno)

U.S. Patent No. 5,368,986 (Terao)

U.S. Patent No. 6,416,837 (Kojima)

U.S. Patent No. 6,132,932 (Miyamoto)

U.S. Patent No. 6,146,733 (Inoue)

U.S. Patent No. 6,153,063 (Yamata)

Each of these documents will be distinguished individually below, but the Applicants summarize the distinctions by noting that none of the applied documents teaches the claimed layer containing not less than 30 atomic % and not more than 85 atomic % of Cr, wherein the layer has a

pillar-like structure ("the layer having the pillar-like structure").

Zhou is applied as teaching the fundamental structure set forth in claim 2 but, lacking a teaching of the claimed interfacial layers, the Examiner applies Kojima as teaching the use of interface layers between a phase change recording layer and adjacent dielectric layers to prevent migration between these layers. Neither of these documents, however, teaches or fairly suggests a layer corresponding to the claimed layer having a pillar-like structure. The Applicants refer the Examiner, for example, to Figure 2B of the present application. The Cr layer shown in the figure has a clear pillar-like structure which is believed to have resulted from absorption of stress applied to the information storage medium during formation of the stacked film structure. As noted on page 36, lines 13-26, warp of the substrate undergoes substantially no change before and after film formation when the layer having the pillar-like structure is included. On the other hand, when the layer is not present, the warp of the substrate is pronounced.

Hirota describes an optical recording medium wherein stresses generated between a reflective layer and a protective layer due to heat expansion of the reflective layer are reduced by including a heat expansion relief layer including a Ti alloy whose heat expansion rate is small, between the

reflective layer and the protective layer. However, Hirota does not disclose that the heat expansion relief layer has a pillar-like structure. Thus, even in combination with Kojima, Hirota does not teach the claimed invention.

Okada discloses a phase change-type optical disk including an absorbing layer 5 and a heat releasing layer 6. However, these layers do not exhibit a pillar-like structure. Thus, even in combination with Kojima, Okada fails to render obvious the claimed invention.

Ohbayashi discloses a phase change-type rewritable optical medium which has first and second dielectric layers, a light absorbing layer, and/or a reflecting layer. Ohbayashi does not disclose a layer corresponding to the claimed layer having a pillar-like structure. Thus, even in combination with Kojima, Ohbayashi does not render the claimed invention unpatentable.

Ohno describes a recording medium including an upper protective layer, a first reflective layer, a diffusion preventing layer, and a second reflective layer, none of which is said to have a pillar-like structure. Thus, in combination with Kojima, Ohno does not render obvious the claimed invention.

The rejection of claims 21-23 over either Ohno, Ohbayashi, Okada, Hirota, or Zhou in view of Kojima and Sekiya is particularly relevant in that claim 22, as rejected,

recited a layer of Ti-Cr or V-Cr alloy containing not less than 30 atomic % and not more than 85 atomic % of Cr, and in that claim 23, as rejected, recited a layer having a pillar-like structure continuing from the lower face to the upper face thereof in at least 80% of a section of the layer. Portions of these claims have been incorporated into independent claim 2 in the present paper.

Against these limitations, the Examiner cited Sekiya, which describes a magneto-optical medium having a protective layer including a titanium alloy. Specifically, the Examiner cited Table 1, page 4 of the publication, which shows various Ti alloys having Cr ratios of 10-80% of the alloy. The purpose of these alloys is to prevent local corrosion using an amorphous metal having no non-uniform structures such as grain boundaries, dislocations, and stacking faults. Thus, Sekiya does not teach a layer having a pillar-like structure, and in fact teaches away from such a layer. Thus, in any combination with the other documents applied in the rejection, Sekiya does not render obvious the claimed invention.

Terao is applied in a rejection of claims 19 and 21. However, it is noted that the limitation in claim 19 that the layer is formed at an Ar flow rate of 120 sccm or more forms grounds for allowing claim 20 (Final Rejection at page 9, item 14). In addition, Terao fails to teach or fairly suggest a layer having a pillar-like structure, as required by amended

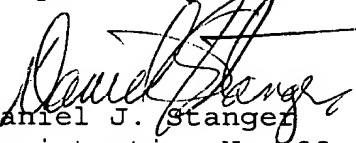
claim 2. Thus, even in combination with Kojima, Terao does not render obvious the claimed invention.

Finally, Miyamoto describes an information recording medium in which grooves having specified widths and depths have specified pitches, wherein address information for recording information in lands and grooves is provided for the leading part of each sector. Among Miyamoto's layered structure is an upper protective layer and first and second metallic layers separate from the recording layer. None of these layers, however, is said to have a pillar-like structure. Thus, even in combination with Kojima or Kojima and Ohbayashi, Miyamoto fails to render obvious the claimed invention.

As noted above, it is believed that the pillar-like structure of the claimed layer results from stress during the stacked film structure formation which would otherwise be imparted to other parts of the structure, such as the substrate. In other words, the claimed layer provides stress compensation to improve the final form of the recording medium, which compensation is exhibited in the pillar-like structure of the layer itself. Absent teaching in the prior art of a resultant layer having a pillar-like structure as claimed, the Applicants submit that a rejection cannot be sustained due to the novel and non-obvious solution taught by the Applicants.

In view of the foregoing amendments and remarks, the Applicants request reconsideration of the rejection and allowance of the claims.

Respectfully submitted,

  
Daniel J. Stanger  
Registration No. 32,846  
Attorney for Applicant(s)

MATTINGLY, STANGER & MALUR, P.C.  
1800 Diagonal Road, Suite 370  
Alexandria, Virginia 22314  
Telephone: (703) 684-1120  
Facsimile: (703) 684-1157  
Date: January 5, 2004